

Missouri Department of Natural Resources



PUBLIC NOTICE

DRAFT MISSOURI STATE OPERATING PERMIT

DATE: April 28, 2006

In accordance with the state Clean Water Law, Chapter 644, RSMo, Clean Water Commission regulation 10 CSR 20-6.010, and the federal Clean Water Act, the applicants listed herein have applied for authorization to either discharge to waters of the state or to operate a no-discharge wastewater treatment facility. The proposed permits for these operations are consistent with applicable water quality standards, effluent standards and/or treatment requirements or suitable timetables to meet these requirements (see 10 CSR 20-7.015 and 7.031). All permits will be issued for a period of five years, unless noted otherwise in the Public Notice for that discharge.

On the basis of preliminary staff review and the application of applicable standards and regulations, the Missouri Department of Natural Resources (MDNR), as administrative agent for the Missouri Clean Water Commission, proposes to issue a permit(s) subject to certain effluent limitations, schedules, and special conditions. The proposed determinations are tentative pending public comment.

Persons wishing to comment on the proposed permit conditions are invited to submit them in writing to the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102, ATTN: Peter Goode, Professional Engineer. Please include the permit number in all comment letters.

Comments should be confined to the issues relating to the proposed action and permit(s) and the effect on water quality. The MDNR may not consider as relevant comments or objections to a permit based on issues outside the authority of the Clean Water Commission, (see Curd v. Mo. Clean Water Commission, 586 S.W.2d 58 Mo. App. 1979).

All comments must be postmarked by May 28, 2006 or received in our office by May 31, 2006. The requirement of a signed document makes it impossible to accept email comments for consideration at this time. Comments will be considered in the formulation of all final determinations regarding the applications. If response to this notice indicates significant public interest, a public meeting or hearing may be held after due notice for the purpose of receiving public comment on the proposed permit or determination. Public hearings and/or issuance of the permit will be conducted or processed according to 10 CSR 20-6.020.

Copies of all draft permits and other information including copies of applicable regulations are available for inspection and copying at DNR's website, <http://www.dnr.mo.gov/env/wpp/index.html>, or at the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102, between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday.

Public Notice Date: April 28, 2006

Permit Number: MO-0093599

St. Louis Regional Office

FACILITY NAME AND ADDRESS	NAME AND ADDRESS OF OWNER
Wentzville Water Reclamation Facility 2355 Mette Road Wentzville, MO 63385	City of Wentzville 310 West Pearce Blvd Wentzville, MO 63385
RECEIVING STREAM & LEGAL DESCRIPTION	TYPE OF DISCHARGE
McCoy Creek (Cuivre River Basin), Sec. 2, T47N, R1W, St. Charles County	Domestic, reissue

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.	MO-0093599
Owner:	City of Wentzville
Address:	310 West Pearce Blvd., Wentzville, MO 63385
Continuing Authority:	Same as above
Address:	Same as above
Facility Name:	Wentzville Water Reclamation Facility
Address:	2355 Mette Road, Wentzville, MO 63385
Legal Description:	SW ¼, SE ¼, NE ¼, Sec. 2, T47N, R1W, St. Charles County
Latitude/Longitude:	
Receiving Stream:	McCoy Creek (C)
First Classified Stream and ID:	McCoy Creek (C) (00214)
USGS Basin & Sub-watershed No.:	(07110008 - 040003)

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

Outfall #001 – POTW - SIC #4952

Influent lift station/grit removal/flow equalization/contact stabilization & extended aeration/nitrification/aerobic sludge digestion/sludge holding tank/sludge is land applied.

Design population equivalent is 39,000.

Design flow is 4.1 million gallons per day(MGD).

Actual flow is 2.64 million gallons per day.

Design sludge production is 700 dry tons/year.

Actual sludge production is 343 dry tons/year.

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

Effective Date

Doyle Childers, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

Expiration Date
MO 780-0041 (10-93)

Edward Galbraith, Director of Staff, Clean Water Commission

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 2 of 7	
					PERMIT NUMBER MO-0093599	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	once/weekday****	24 hr. total
Biochemical Oxygen Demand ₅ **	mg/L	30		20	once/weekday****	24 hr. composite
Total Suspended Solids**	mg/L	45		30	once/weekday****	24 hr. composite
Ammonia (May 1 - Sept. 30)	mg/L	2.5			once/weekday****	grab
(Oct. 1 - April 30)	mg/L	3.5			once/weekday****	grab
pH - Units	SU	***		***	once/weekday****	grab
Oil and Grease	mg/L	15		10	once/month	grab
Copper, Total Recoverable	µg/L	29		29	once/month	24 hr. comp.
Nickel, Total Recoverable	µg/L	500		500	once/month	24 hr. comp.
Chromium, Total Recoverable	µg/L	42		42	once/month	24 hr. comp.
Zinc, Total Recoverable	µg/L	345		345	once/month	24 hr. comp.
Silver, Total Recoverable	µg/L	8.2		8.2	once/month	24 hr. comp.
Cyanide (Amenable to Chlorination)	µg/L	5		5	once/month	24 hr. comp.
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE _____.						
Whole Effluent Toxicity (WET) test	% Survival	(See Special Conditions)			once/year in April	24 hr. comp.
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE _____.						
<u>Outfall #002 - Storm Water</u>						
Flow	MGD	*		*	once/quarter*****	grab
Biochemical Oxygen Demands	mg/L	*		*	once/quarter*****	grab
Settleable Solids	mL/L/hr	1.5		1.0	once/quarter*****	grab
pH - Units	SU	***		***	once/quarter*****	grab
Oil and Grease	mg/L	15		10	once/quarter*****	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE _____. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I, II & III</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

- * Monitoring requirement only.
- ** This facility is required to meet a removal efficiency of 85% or more.
- *** pH is measured in pH units and is not to be averaged. The pH is to be maintained at or above 6.0 pH units.
- **** Once each weekday means: Monday, Tuesday, Wednesday, Thursday and Friday.
- ***** Stormwater samples are to be collected as a grab sample collected from the locations at which stormwater leaves the property boundaries during a rainfall event which exceeds 0.1 inch. If stormwater leaves the property boundary in more than one location, a composite sample may be collected so as to be representative of the overall stormwater quality leaving the property.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
 - (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
 - (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
 - (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
 - (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.
2. All outfalls must be clearly marked in the field.
3. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.
4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

 - (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
 - (1) One hundred micrograms per liter (100 µg/L);
 - (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established in Part A of the permit by the Director.
 - (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.
 - (c) That the effluent limit established in part A of the permit will be exceeded.
5. Report as no-discharge when a discharge does not occur during the report period.

C. SPECIAL CONDITIONS (continued)

6. Water Quality Standards

- (a) Discharges to waters of the state shall not cause a violation of water quality standards rule under 10 CSR 20-7.031, including both specific and general criteria.
- (b) General Criteria. The following general water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:
 - (1) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
 - (2) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
 - (3) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
 - (4) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
 - (5) There shall be no significant human health hazard from incidental contact with the water;
 - (6) There shall be no acute toxicity to livestock or wildlife watering;
 - (7) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
 - (8) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

7. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities

- (a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.
- (b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids. Permit Standard Conditions, Part III shall apply to the land application of biosolids. Permittee shall notify the department at least 180 days prior to the planned removal of biosolids. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

8. REQUIREMENTS FOR STORM WATER OUTFALL

Those requirements do not supersede nor remove liability for compliance with county and other local ordinances.

- 1. All paint, solvents, petroleum products and petroleum waste products (except fuels), and storage containers (such as drums, cans, or cartons) shall be stored so that these materials are not exposed to stormwater. Spill prevention, control and/or management shall be provided sufficient to prevent any spills of these pollutants from entering a water of the state. Any contaminant system used to implement this requirement shall be constructed of materials compatible with the substances contained and shall also prevent the contamination of groundwater.
- 2. Good housekeeping practices shall be maintained on the site to keep solid waste from entry into waters of the state.
- 3. All fueling facilities present on the site shall adhere to applicable federal and state regulations concerning underground storage, above ground storage, and dispensers, including spill prevention, control and counter measures.
- 4. Substances regulated by federal law under the Resource Conservation and Recovery Act (RCRA) or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that are transported, stored or used for maintenance, cleaning or repair shall be managed accordingly to the provisions of RCRA or CERCLA.
- 5. An individual shall be designated by the permittee as responsible for environmental matters. Staff of the permitted facility shall inspect, on workdays, any structures that function to prevent pollution of storm water or to improve pollutants from storm water and of the facility in general to ensure that any Best Management Practices are continually implemented and effective.
- 6. All involved personnel shall be trained in material handling and storage, and housekeeping of maintenance area. Upon request, proof of training shall be submitted to the Department.

9. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
001	100	Once/year	24 hr composite	April

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a single-dilution test in the months and at the frequency specified above. If the effluent passes the test, do not repeat the test until the next test period.
Submit test results along with complete copies of the test reports as received from the laboratory within 30 calendar days of availability to the WPP, Water Quality Monitoring and Assessment Section, P.O. Box 176, Jefferson City, MO 65102.
- (2) If the effluent fails the test, a multiple dilution test shall be performed within 30 calendar days, and biweekly thereafter, until one of the following conditions are met:
 - (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
- (3) The permittee shall submit a summary of all test results for the test series along with complete copies of the test reports as received from the laboratory to the WPP, Water Quality Monitoring and Assessment Section, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
- (4) Additionally, the following shall apply upon failure of the third test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact WPP, Water Quality Monitoring and Assessment Section to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the Planning Section of the WPP within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
- (5) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
- (6) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
- (7) All failing test results shall be reported to WPP, Water Quality Monitoring and Assessment Section, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.
- (8) When WET test sampling is required to run over one DMR period, each DMR report shall contain information generated during the reporting period.
- (9) Submit a concise summary of all test results with the annual report.

(b) PASS/FAIL procedure and effluent limitations:

- (1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. The appropriate statistical tests of significance will be those outlined in the most current USEPA acute toxicity manual or those specified by the MDNR.
- (2) To pass a multiple-dilution test:
 - (a) the computed percent effluent at the edge of the zone of initial dilution, Acceptable Effluent Concentration (AEC), must be less than three-tenths (0.3) of the LC_{50} concentration for the most sensitive of the test organisms; or,
 - (b) all dilutions equal to or less than the AEC must be nontoxic. Failure of one multiple-dilution test is an effluent limit violation.

(c) Test Conditions

- (1) Test Type: Acute Static non-renewal
- (2) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.
- (3) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.
- (4) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.
- (5) Single-dilution tests will be run with:
 - (a) Effluent at the AEC concentration;
 - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (c) reconstituted water.
- (6) Multiple-dilution tests will be run with:
 - (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
 - (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
 - (c) reconstituted water.
- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

D. SCHEDULE OF COMPLIANCE

Permittee shall complete construction of Phase I upgrade by December 31, 2006, and meet the EFFLUENT LIMITATIONS set forth in the Water Quality Review Sheet dated June 30, 2005, by March 1, 2007.

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

Date of Fact Sheet:

Date of Public Notice:

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
FACT SHEET

This Fact Sheet explains the applicable regulations, rationale for development of this permit and the public participation process.

NPDES PERMIT NUMBER: MO-0093599

FACILITY NAME: Wentzville Water Reclamation Center

OWNER NAME: City of Wentzville

LOCATION: 2355 Mette Road, Wentzville, MO 63385 County: St. Charles

RECEIVING STREAM: McCoy Creek (Cuivre River Basin)

FACILITY CONTACT PERSON: Gary Miller TELEPHONE: (314) 327-4174

FACILITY DESCRIPTION AND RATIONALE

The City of Wentzville operates a secondary activated sludge treatment facility with a design flow of 4.1 MGD with a discharge to McCoy Creek, and has applied for renewal of the Missouri State Operating Permit. The Department proposes to reissue the permit as it currently exists for one year. The permittee is proceeding with construction to meet the Final Effluent limitations established by the attached Water Quality Review Sheet.

Effluent will continue to be discharged to McCoy Creek, a tributary of the Cuivre River, in the SW $\frac{1}{4}$ of the SE $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Sec. 2, T47N, R1E in St. Charles County. McCoy Creek is classified "C" which means that it may cease flowing during dry periods but still maintain permanent pools which support aquatic life. Designated beneficial water uses include livestock watering and support of aquatic life.

This permit will be issued for a period of one year.



Missouri Department of Natural Resources
Water Protection Program
Water Pollution Control Branch
NPDES PERMITS AND ENGINEERING SECTION

Water Quality Review Sheet
Determination of Effluent Limits

FACILITY INFORMATION

FACILITY NAME: City of Wentzville Water Reclamation Center (WRC) NPDES #: MO-0093599

FACILITY TYPE/DESCRIPTION: 14.1 MGD extended aeration facility, UV disinfection.

EDU: Plains/MS Tribs btwn Des Moines & MO 8-DIGIT HUC: 07110008 COUNTY: St. Charles

LEGAL DESCRIPTION: SW SE NE Sec. 2, T47N, R1E LATITUDE/LONGITUDE: +3851431/-09052073

WATER QUALITY HISTORY: Reasonable potential analyses were conducted for ammonia as nitrogen, cyanide, and total recoverable metals (Cr, Cu, Ag, Ni, and Zn); results are available upon request.

Outfall Characteristics

OUTFALL	DESIGN FLOW (CFS)	TREATMENT TYPE	RECEIVING WATERBODY	OTHER
001	21.9	Secondary	McCoy Creek	

Receiving Waterbody Information

WATERBODY	CLASS	7Q10 (CFS)	*DESIGNATED USES	OTHER CHARACTERISTICS
McCoy Creek	C	0.0	LWW, AQL	WBID: 0214

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warm water Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

COMMENTS: A water quality impact study was submitted by Carollo Engineers on behalf of the city to determine wasteload allocations protective of water quality in McCoy Creek upon final buildout of the WRC. The study, "City of Wentzville, Missouri Water Reclamation Center Expansion Project, Technical Memorandum, McCoy Creek Water Quality Study, Final, August 2005",

was reviewed and used by
 staff to develop BOD₅, TSS, DO, and ammonia as nitrogen effluent
 limitations for the facility.

Mixing Considerations

Mixing Zone (MZ): Length of one-quarter (1/4) mile [10 CSR 20-7.031(4)(A)5.B.(I)(a)].

Zone of Initial Dilution (ZID): Not allowed [10 CSR 20-7.031(4)(A)5.B.(I)(b)].

Permit Limits and Information

TMDL WATERSHED:

(Y OR N)

N

W.L.A. STUDY

CONDUCTED:
(Y OR N)

Y

DISINFECTION REQUIRED:

(Y OR N)

Y

USE ATTAINABILITY

ANALYSIS:
(Y OR N)

Y

OUTFALL #001

WET TEST (Y OR

Y

N):

ONCE/YEAR

100%

LIMIT:

10 CSR 20-

FREQUENCY: A.E.C.

7.031(3)(I)

PARAMETER	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MONITORING FREQUENCY
FLOW	MONITOR			Once/day
BOD ₅ (MG/L)		30	20	Once/Weekday
TSS (MG/L)		45	30	Once/Weekday
PH (S.U.)	6-9		6-9	Once/Weekday
DISSOLVED OXYGEN (MG/L)	**		**	Once/Weekday
AMMONIA AS N (MG/L) (MAY 1 - OCT 31)	1.6		0.8	Once/Weekday
AMMONIA AS N (MG/L) (NOV 1 - APR 30)	2.8		1.4	Once/Weekday
OIL & GREASE (MG/L)	15		10	Once/Month
FECAL COLIFORM* (COLONIES/100 ML)	1000		400	Once/Month
CHROMIUM, TOTAL REC. (µG/L)	56.1		21.4	Once/Month
COPPER, TOTAL REC. (µG/L)	44.5		14.5	Once/Month
NICKEL, TOTAL REC. (µG/L)	*		*	Once/Month
SILVER, TOTAL REC. (µG/L)	7.5		2.9	Once/Month
ZINC, TOTAL REC. (µG/L)	379		165	Once/Month
CYANIDE, AMENABLE TO CHLORINATION (µG/L)	8.8		3.9	Once/Month

* - April 1 - October 31, ** - Dissolved Oxygen Minimum Concentration = 6.0 mg/L

Please report the date, time, and location for each parameter sampled along with the average daily flow (actual flow measured or estimated, not design flow). All the parameters should be sampled on the same day and within no more than a 2-hour period. Dissolved oxygen (DO) measurements are to be

taken during the period from one hour prior to sunrise to one and one-half hour after sunrise. If discharge is contingent to storm events, rainfall should be measured every time there is a discharge.

OUTFALL #002

Effluent limits and monitoring requirements from the existing facility operating permit should be retained.

Receiving Water Monitoring Requirements

PARAMETER(S)	SAMPLING FREQUENCY	SAMPLE TYPE	LOCATION
Dissolved Oxygen	Once/quarter	Grab	S1 – Upstream of Outfall #001 S2 – Mette Road Bridge
Temperature	Once/quarter	Grab	
pH	Once/quarter	Grab	
Ammonia as Nitrogen	Once/quarter	Grab	

Derivation and Discussion of Limits

Wasteload allocations were derived from water quality model results or water quality criteria and the dilution equation below:

$$C = \frac{(C_s * Q_s) + (C_e * Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow (cfs)

C_e = effluent concentration

Q_e = effluent flow (cfs)

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable acute water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

- **Biochemical Oxygen Demand (BOD₅)** – Staff have reviewed the wasteload allocations for BOD₅ found in the report "City of Wentzville, Missouri Water Reclamation Center Expansion Project, Technical Memorandum, McCoy Creek Water Quality Study, Final, August 2005" submitted by Carollo Engineers. The wasteload allocations used in the report are the same as the existing BOD₅ effluent limitations for this facility and attain water quality standards at a dissolved oxygen concentration of 6.0 mg/L. The existing BOD₅ effluent limitations of 30 mg/L weekly average, 20 mg/L monthly average will therefore be retained.

- **Total Suspended Solids (TSS)** - Existing TSS effluent limitations of 45 mg/L weekly average, 30 mg/L monthly average are expected to be protective of water quality in McCoy Creek and will be retained [10 CSR 20-7.015(8)(B)1.]
- **pH** - pH shall be maintained in the range from six to nine (6 - 9) standard units [10 CSR 20-7.015(8)(B)2.]
- **Dissolved Oxygen** - Input parameters to the water quality model submitted by Carollo Engineers indicate a dissolved oxygen minimum concentration of 6.0 mg/L is required to ensure maintenance of water quality criteria in McCoy Creek.
- **Ammonia as Nitrogen** - General warm-water fishery ammonia criteria apply [10 CSR 20-7.031, Table B]. Background ammonia as nitrogen for receiving stream = 0.01 mg/L

Season	Temp (°C)	pH (SU)	Total Ammonia CCC (mg/L)	Total Ammonia CMC (mg/L)
Summer	26	7.8	1.2	14.0
Winter	6	7.8	2.1	16.4

$$C_e = ((Q_e + Q_s)C - (Q_s * C_s))/Q_e$$

Summer

Ammonia as Nitrogen CCC = 1.2/1.2 = 1.0 mg/L
 Ammonia as Nitrogen CMC = 14.0/1.2 = 11.7 mg/L

Carollo WLA: 1.0 mg/L

$$LTA_c = 1.0 \text{ mg/L} (0.527) = \mathbf{0.5 \text{ mg/L}} \quad [CV = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$MDL = 0.5 \text{ mg/L} * 3.11 = 1.6 \text{ mg/L} \quad [CV = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$AML = 0.5 \text{ mg/L} * 1.55 = 0.8 \text{ mg/L} \quad [CV = 0.6, 95^{\text{th}} \text{ Percentile},$$

n = 4]

Winter

Ammonia as Nitrogen CCC = 2.1/1.2 = 1.8 mg/L
 Ammonia as Nitrogen CMC = 16.4/1.2 = 13.7 mg/L

Carollo WLA: 1.8 mg/L

$$LTA_c = 1.8 \text{ mg/L} (0.527) = \mathbf{0.9 \text{ mg/L}} \quad [CV = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$MDL = 0.9 \text{ mg/L} * 3.11 = 2.8 \text{ mg/L} \quad [CV = 0.6, 99^{\text{th}} \text{ Percentile}]$$

$$AML = 0.9 \text{ mg/L} * 1.55 = 1.4 \text{ mg/L} \quad [CV = 0.6, 95^{\text{th}} \text{ Percentile},$$

n = 4]

Season	Maximum Daily Limit (mg/L)	Average Monthly Limit (mg/L)
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Summer	1.6	0.8
Winter	2.8	1.4

- **Oil & Grease** - Conventional pollutant, effluent limitation for the protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.

- **Fecal Coliform** - All classified waters in Missouri shall be designated for Whole Body Contact Recreation. Operating permits issued following this rule will require effluent limits for applicable bacteria criteria unless a Use Attainability Analysis (UAA) is conducted and approved. A UAA was conducted for McCoy Creek in July 2005 and the whole body contact recreation use was retained.

Effluent limitations of 400 colonies/100 mL monthly average, 1000 colonies/100 mL daily maximum

apply during the recreational season (April 1 - October 31) [10 CSR 20-7.015(4)(B)4.] Future renewals of the facility operating permit will contain effluent limitations for E. coli which will replace fecal coliform as the applicable bacteria criteria in Missouri's water quality standards.

- **Metals**. Effluent limitations for most total recoverable metals (Cr, Cu, Ag, and Zn) have been retained as a result of the reasonable potential analyses. A monitoring only requirement will be established for nickel as the reasonable potential analysis showed no reasonable potential to exceed applicable water quality criteria. Electronic copies of the reasonable potential analyses are available upon request.

METAL	CMC (µg/L)	CCC (µg/L)	RECEIVING WATER CONCENTRATION (µg/L)	REASONABLE POTENTIAL
Chromium	62	42	144	<u>Yes</u>
Copper	43	28	522	<u>Yes</u>
Nickel	4600	500	111	<u>No</u>
Silver	7	N/A	21	<u>Yes</u>
Zinc	371	340	1135	<u>Yes</u>

Effluent limitations for total recoverable metals were developed using methods and procedures outlined in EPA/505/2-90-001 and "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion" (EPA 823-B-96-007). General warm-water fishery criteria apply and water hardness = 162.5 mg/L.

Due to the absence of contemporaneous effluent and in-stream data for total recoverable metals, dissolved metals, hardness, and total suspended solids with which to calculate metals translators, partitioning between the dissolved and absorbed phases was assumed to be minimal (Section 5.7.3, EPA/505/2-90-001). Freshwater criteria conversion factors for dissolved metals were used as the metals translator as recommended in guidance (Section 1.3, 1.5.3, and Table 1, EPA 823-B-96-007). If concurrent site-specific data for total recoverable metals, dissolved metals, hardness, and total suspended solids are provided to the department, partitioning evaluations may be considered and site-specific translators developed.

METAL	CONVERSION FACTORS		WQBEL
	ACUTE	CHRONIC	
Chromium	0.982	0.962	Yes
Copper	0.960	0.960	Yes
Silver	0.85	N/A	Yes
Zinc	0.978	0.986	Yes

Chromium (Cr): General Warm-Water Fishery Protection of Aquatic Life CCC = 42 µg/L, CMC = 62 µg/L [10 CSR 20-7.031, Table A]; Background Cr = 0 µg/L

$$C \text{ (Chronic)} = CCC/CF = 42/0.962 = 43.7 \text{ µg/L}$$

$$C \text{ (Acute)} = CMC/CF = 62/0.982 = 63.1 \text{ µg/L}$$

$$\text{Chronic WLA: } C_e = ((0.0 + 21.9)43.7 - (0.0 * 0.0))/21.9$$

$$C_e = 43.7 \text{ µg/L}$$

$$\text{Acute WLA: } C_e = ((0.0 + 21.9)63.1 - (0.0 * 0.0))/21.9$$

$$C_e = 63.1 \text{ µg/L}$$

$$LTA_c = 43.7 \text{ µg/L (0.345)} = 15.1 \text{ µg/L} \quad [CV = 1.1, 99^{th} \text{ Percentile}]$$

$$LTA_a = 63.1 \text{ µg/L (0.167)} = \mathbf{10.5 \text{ µg/L}} \quad [CV = 1.1, 99^{th} \text{ Percentile}]$$

$$MDL = 10.5 \text{ µg/L} * 5.34 = 56.1 \text{ µg/L} \quad [CV = 1.1, 99^{th} \text{ Percentile}]$$

$$AML = 10.5 \text{ µg/L} * 2.04 = 21.4 \text{ µg/L} \quad [CV = 1.1, 95^{th} \text{ Percentile, } n = 4]$$

Copper (Cu): General Warm-Water Fishery Protection of Aquatic Life CCC = 28 µg/L, CMC = 43 µg/L [10 CSR 20-7.031, Table A]; Background Cu = 0 µg/L

$$C \text{ (Chronic)} = CCC/CF = 28/0.960 = 29.2 \text{ µg/L}$$

$$C \text{ (Acute)} = CMC/CF = 43/0.960 = 44.8 \text{ µg/L}$$

$$\text{Chronic WLA: } C_e = ((0.0 + 21.9)29.2 - (0.0 * 0.0))/21.9$$

$$C_e = 29.2 \text{ µg/L}$$

$$\text{Acute WLA: } C_e = ((0.0 + 21.9)44.8 - (0.0 * 0.0))/21.9$$

$$C_e = 44.8 \text{ µg/L}$$

$$LTA_c = 29.2 \text{ µg/L (0.204)} = 6.0 \text{ µg/L} \quad [CV = 2.0, 99^{th} \text{ Percentile}]$$

$$LTA_a = 44.8 \text{ µg/L (0.117)} = \mathbf{5.2 \text{ µg/L}} \quad [CV = 2.0, 99^{th} \text{ Percentile}]$$

$$MDL = 5.2 \text{ µg/L} * 8.55 = 44.5 \text{ µg/L} \quad [CV = 2.0, 99^{th} \text{ Percentile}]$$

$$AML = 5.2 \text{ µg/L} * 2.78 = 14.5 \text{ µg/L} \quad [CV = 2.0, 95^{th} \text{ Percentile, } n = 4]$$

Silver (Ag): Protection of Aquatic Life CMC = 7 µg/L [10 CSR 20-7.031, Table A]; Background

Ag = 0 µg/L

C (Acute) = CMC/CF = 7.0/0.85 = 8.2 µg/L

Acute WLA: $C_a = ((0.0 + 21.9)8.2 - (0.0 * 0.0))/21.9$

$C_a = 8.2 \text{ µg/L}$

$LTA_a = 8.2 \text{ µg/L} (0.167) = 1.4 \text{ µg/L}$ [CV = 1.1, 99th Percentile]

MDL = 1.4 µg/L * 5.34 = 7.5 µg/L [CV = 1.1, 99th Percentile]

AML = 1.4 µg/L * 2.04 = 2.9 µg/L [CV = 1.1, 95th Percentile, n = 4]

Zinc (Zn): General Warm-Water Fishery Protection of Aquatic Life CCC = 340 µg/L, CMC =

371 µg/L [10 CSR 20-7.031, Table A]; Background Zn = 0 µg/L

C (Chronic) = CCC/CF = 340/0.986 = 345 µg/L

C (Acute) = CMC/CF = 371/0.978 = 379 µg/L

Chronic WLA: $C_e = ((0.0 + 21.9)345 - (0.0 * 0.0))/21.9$

$C_e = 345 \text{ µg/L}$

Acute WLA: $C_e = ((0.0 + 21.9)379 - (0.0 * 0.0))/21.9$

$C_e = 379 \text{ µg/L}$

$LTA_c = 345 \text{ µg/L} (0.440) = 152 \text{ µg/L}$ [CV = 0.8, 99th Percentile]

$LTA_a = 379 \text{ µg/L} (0.249) = 94.4 \text{ µg/L}$ [CV = 0.8, 99th Percentile]

MDL = 94.4 µg/L * 4.01 = 379 µg/L [CV = 0.8, 99th Percentile]

AML = 94.4 µg/L * 1.75 = 165 µg/L [CV = 0.8, 95th Percentile, n = 4]

- Cyanide, Amenable to Chlorination: Protection of Aquatic Life CCC = 5 µg/L, CMC = 22 µg/L, Background CN = 0 µg/L

Chronic WLA: $C_e = ((0.0 + 21.9)5 - (0.0 * 0.0))/21.9$

$C_e = 5 \text{ µg/L}$

Acute WLA: $C_e = ((0.0 + 21.9)22 - (0.0 * 0.0))/21.9$

$C_e = 22 \text{ µg/L}$

$LTA_c = 5 \text{ µg/L} (0.440) = 2.2 \text{ µg/L}$ [CV = 0.8, 99th Percentile]

$LTA_a = 22 \text{ µg/L} (0.249) = 5.5 \text{ µg/L}$ [CV = 0.8, 99th Percentile]

MDL = 2.2 µg/L * 4.01 = 8.8 µg/L [CV = 0.8, 99th Percentile]

AML = 2.2 µg/L * 1.75 = 3.9 µg/L [CV = 0.8, 95th Percentile, n = 4]

Reviewer: Paul Anderson
Date: June 30, 2005
Unit Chief: Refaat Mefrakis

Monitoring and effluent limits contained within this document have been developed in accordance with EPA guidelines using the best available data and are believed to be consistent with Missouri's Water Quality Standards and Effluent Regulations. If additional water quality data are available that may affect the recommended monitoring and effluent limits, please forward these data to the author.

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